REMARKS

The Examiner is thanked for the Official Action of December 13, 2005. This request for reconsideration is intended to be fully responsive thereto.

CLAIM AMENDMENT

Claims 5-10 were amendment and claims 12 and 13 were newly added. Amendments to claims 5-10 are mainly for the clarification and formality purposes. All amendments other than specifically hereunder are intended solely for the clarification and formality amendments. No new matter has been added.

Regarding claim 1, a phrase, "without use of a binder", has been added to further distinguish from the cited references, i.e., U.S. Patent No. 6667131B1 to Vitins et al. (hereinafter, Vitins et al.) and U.S. Publication No. 2003/0143477 to Goda et al. (hereinafter, Goda et al.). This language is fully supported by the description in the current specification especially in the paragraphs [0043] and [0064]. Here, the conductor-mixed active electrode material is such that the electrode active material and the conductive material are bound as stirring the electrode active material and the conductive material together in a ball mill without use of binder. This binding occurs when the electrode active material is stirred with the conductive material and balls in the ball mill and the surfaces thereof induce defects, thereby binding the conductive material around the surfaces with that surfaces. No new matter has been added.

Regarding claim 7, the language of the previous claim 7 were amended to characterize that the surface on the current collecting material in contact with an electrode layer is rough. This language is fully supported by the description in the current specification especially in the paragraphs [0045] and [0046]. These paragraphs clearly show that the surface is rough.

Regarding newly added claims 12 and 13, these additional claims are fully supported by the description in the current specification especially in the paragraphs [0043] and [0076], where they show that the conductive material is coupled to part around the active electrode material in a flocculent form.

In addition, the words, "couple", "couples", "coupled", "coupling", or "coupling" originally used in the specification and claims were amended to "bind", "binds", "bound", and "binding" for the clarification purpose and also to match the language in the original PCT application in Japanese. No new

matter has been added.

CLAIM OBJECTION

Claims 5-8 were objected to because of the term "balls". Claim 5 did state "boll" instead of "ball". The Applicant amended claim 5 to read "ball". These "ball" refers to the balls of the ball mill, in which the ball are used to stir the electrode active material and the conductive material to make the conductive material adhere around the electrode active material. Therefore, the term "ball" or "balls" should be appropriate term; however, claims 5-8 were amendment for the clarification purpose.

REJECTION UNDER 35 U.S.C. 102(e) (Vitins et al.)

Claims 5-6 and 9-10 were rejected under 35 U.S.C. 102(e) as being anticipated by Vitins et al. The Examiner basically suggested that Vitins et al. discloses all the elements of claim 5. The Examiner also suggested that Vitins et al. discloses the use of lithium magnate as in claims 6 and 10 and the method of making the lithium rechargeable battery of claim 9.

The Examiner is respectfully suggested to review the amended claims. Clams after amendments are clearly different from Vitins et al.

Vitins et al. provides rechargeable lithium cells of the lithium-ion or the lithium-alloy type, in which the cathode material has a high capacity, and which can be used for alleviation of the consequences of the capacity loss as well as for subsequent charge-discharge cycling. In Example 4, lines 40-50, column 9, composite Li2Co0.4Mn1.6O4/LiMn2O4 electrodes were made by mixing 85% by weight of mixed oxide (1:3.59 by weight), 10% by weight of Shawinigan Black and 5% by weight of polymer binder. Here, the mixture was treated in a ball mill for 17 hours until a uniform material of ink-like consistency was formed. Vitins et al. uses the ball in the ball mill to stir the electrode active material, conductive material and a binder equally or consistently. The consistent stirring gives the entire material the ink-like consistency, which facilitates the coating of the electrode layer on the current collecting material.

In the present invention, the conductor-mixed electrode active material is obtained by stirring and mixing the electrode material having lithium and the conductive material in the ball mill without the binder. Unlike Vitins et al., this invention does not requires the ink-like consistency for coating the electrode layer on the current collecting material. No teaching or suggestion of the

stirring and mixing without the binder is not taught or suggested in Vitins et al.

Because no binder is necessary to bind the electrode active material 24 and the conductive material 3, the resulted product is not covered by the binder generally acting as an insulator, thereby giving more effective electron migration between the electrode active material 24 and the conductive material. Furthermore, ion migration between the electrode active material 24 and the surrounding electrolyte becomes more effective. All these lead to good battery characteristics.

Using the binder as Vitins et al. to bind the electrode active material 24 and the conductive material 3 coats the electrode active material 24 with the insulator, i.e., binder, which restricts the electron migration between the electrode active material 24 and the conductive material. It also restricts the ion migration between the electrode active material 24 and the surrounding electrolyte becomes more effective.

Accordingly, the binding without binder as disclosed in the present invention gives an significant difference from Vitins et al.

Regarding the Examiner's rejection of claims 6, 9, and 10, because of the same reasoning above, Vitins et al. should not be a reference to reject the claims based on 35 U.S.C. 103(a).

REJECTION UNDER 35 U.S.C. 103(a) (Vitins et al. and Goda et al.)

Claims 7-8 were rejected under 35 U.S.C. 103(a) as being unpatentable over Vitins et al. as applied to claims 5 and 9-10 above, and further in view of Goda et al. The Examiner suggested that Vitins teaches a lithium rechargeable battery ad described in the §102(e) rejection and regarding claim 8, teaches a binder that anchors the electrode material to an aluminum current collector as in the Example 4. Then, the Examiner admitted that Vitins is silent to the current collector having more than one recess portions, which can become obvious when combining with the teaching of Goda et al.

Goda et al. discloses a battery electrode plate constructed by coating a core member with a mixture plate that chiefly includes an active material. As shown in FIGS. 2 and 3, the core member 1 has plan parts 5 formed with grooves 15, and the core member 1 is made of a metal sheet 3 which is formed with strips of first bowed portions 4 and second bowed portions 7 arranged parallel to each other along one direction X of the metal sheet 3 and alternatively protruding one the front and back side of the metal sheet.

First of all, because Vitins et al. does not act as a prior art to reject the amended claim 5, the claim 7 should not be rejected based on the theory the Examiner introduced in this official action. However, claims 7 of the present invention was amended to read " a surface on the current collecting material in contact with an electrode layer is rough" instead of having recesses. This is to clarify the difference between the present invention and Goda et al. Surface roughness gives a larger surface area and enlarges the contacting surface with the electrical conduction assistant, which enables to gather larger electric current on the current collecting material.

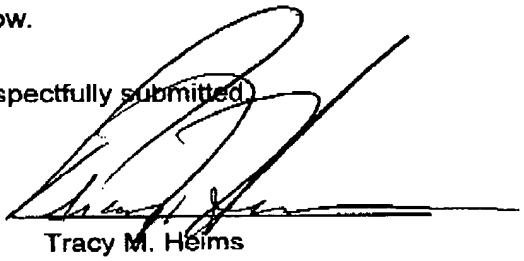
This difference itself should be sufficient to overcome the Examiner's rejection on this ground.

Conclusion

Accordingly, it is submitted that amended claims 5-10 and new dependent claims 11 and 12 define the invention over the prior art and notice to this effect is respectfully solicited. Applicant has either complied with all Examiner recommendations or has effectively argued against the Examiner's objections/rejections and believes that all currently pending claims are now in condition for allowance. No new matter has been added.

Should the examiner believe further discussion regarding the above claimed language would expedite prosecution he is invited to contact the undersigned at the number listed below.

Respectfully submitted,

By: 

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